

IN THE CLAIMS

This listing of the claims will replace all prior versions and listings of claims in the present application.

Listing of Claims

Claim 1 (canceled).

2. (previously presented) A packet communication device,
comprising:

a plurality of line interfaces capable of reception or transmission of a packet;

a plurality of ports to which said plurality of line interfaces are connected and to which at least one functional processor to be used to perform functional processing on an incoming packet received by any of said plurality of line interfaces can be connected as needed;

a function item judgment unit for judging a function item to be required for said incoming packet;

a forwarding information generator for determining a forwarding port for said incoming packet in accordance with said function item obtained from judging by said function item judgment unit and imparting to said incoming packet forwarding information for designating said forwarding port; and

a forwarding path switching unit for switching a forwarding path when forwarding said incoming packet among said plurality of ports based on said forwarding information,

wherein when said function item judgment unit has judged that a plurality of functional processings are required for said incoming packet, the plurality of forwarding information corresponding to functional processors

capable of executing said required functional processings is imparted to said incoming packets at the forwarding information generator in order to forward said incoming packets successively to a plurality of ports to which the functional processors capable of executing said required functional processings are connected respectively.

3. (previously presented) The packet communication device according to Claim 2, wherein in order to forward those incoming packets which have been subjected to said plurality of functional processing to any of said plurality of line interfaces, said forwarding information generator further imparts, to said packet, forwarding information corresponding to a port, to which the said line interface is connected for forwarding said incoming packets.

4. (previously presented) The packet communication device according to Claim 2 or 3, further comprising:

a forwarding information eliminator for eliminating, after said incoming packet is forwarded to a predetermined port based on said forwarding information, forwarding information corresponding to said port from forwarding information added to said incoming packet.

5. (previously presented) The packet communication device according to Claim 2 or 3, wherein as said incoming packet is successively forwarded based on said forwarding information, said forwarding information generator further imparts, to said incoming packet, subsequent forwarding

information for designating in said forwarding information which information concerning the subsequent forwarding destination is, and

wherein said device further comprises:

a forwarding information renewal unit for renewing, after said incoming packet is forwarded to a port to be designated in said forwarding information and said subsequent forwarding information, said subsequent forwarding information.

6. (original) The packet communication device according to Claim 5, wherein said forwarding information and said subsequent forwarding information will be erased before said incoming packet is outputted to the outside from any of said plurality of line interfaces.

7. (previously presented) The packet communication device according to claim 2, wherein said functional judgment unit and said forwarding information generator are installed in at least one of said plurality of line interfaces.

8. (previously presented) The packet communication device according to claim 2, wherein at least one said functional processor is further provided with said functional judgment processor and said forwarding information generator.

9. (previously presented) A packet communication device, comprising:

a plurality of line interfaces capable of reception or transmission of a packet;

one or a plurality of functional processors to be used to perform functional processing on an incoming packet received by any of said plurality of line interfaces;

a plurality of ports to which said plurality of line interfaces and said one or a plurality functional processors are connected;

a function item judgment unit for judging a function item to be required for said incoming packet;

a forwarding information generator for determining a forwarding port for said incoming packet in accordance with said function item obtained by judging by said function item judgment unit, and imparting to said incoming packet forwarding information for designating said forwarding port; and

a functional processor with a forwarding information generation function for performing functional processing on said incoming packet, determining, as a forwarding port, a port to which any of said plurality of line interfaces is connected based on a result of said functional processing, and imparting to said incoming packet forwarding information corresponding to said forwarding port,

when said function item judgment unit has judged that a plurality of functional processings are required for said incoming packet the plurality of forwarding information corresponding to functional processors capable of executing said required functional processings is imparted to said incoming packet at the forwarding information generator in order to forward said incoming packet successively to a plurality of ports to which the functional

processors capable of executing said required functional processings are connected respectively.

10. (previously presented) The packet communication device according to Claim 9, wherein said function item judgment unit and said forwarding information generator are incorporated in at least in one of said plural line interfaces, and

wherein when a forwarding port cannot be determined, said incoming packet is forwarded to a port to which a functional processor with said forwarding information generation function is connected.

11. (previously presented) The packet communication device according to Claim 10, wherein when said incoming packet conforms to a first predetermined communication protocol, all forwarding ports, including a port to which a line interface for transmitting said incoming packet to the outside is connected, are determined by the line interface which has received said incoming packet, and

wherein when said incoming packet conforms to a second predetermined communication protocol, in said functional processor with said forwarding information generation function a port to which a line interface for transmitting said incoming packet to the outside is connected is determined as a forwarding port.

12. (previously presented) A packet communication device, comprising:

a plurality of line interfaces capable of reception or transmission of a packet;

a plurality of functional processors capable of performing the same functional processing on an incoming packet received by any of said plurality of line interfaces;

a plurality of ports to which said plurality of line interfaces and said plurality of functional processors are connected;

a function item judgment unit for judging a function item to be required for said incoming packet; and

a forwarding information generator for determining a forwarding port of said incoming packet in response to said function item judged by said function item judgment unit, and imparting to said incoming packet forwarding information for designating said forwarding port,

wherein when the same address information is imparted to said incoming packet to be received successively by any of said plurality of line interfaces, a port to which the same functional processor is connected of said plurality of functional processors, is fixedly designated as said forwarding port;

a forwarding path switching unit for switching a forwarding path when forwarding among said plurality of ports based on said forwarding information,

when said function item judgment unit has judged that a plurality of functional processings are required for said incoming packet the plurality of forwarding information corresponding to functional processors capable of executing said required functional processings is imparted to said incoming packet at the forwarding information generator in order to forward said incoming packet successively to a plurality of ports to which the functional

processors capable of executing said required functional processings are connected respectively.

13. (currently amended) The packet communication device according to Claim 12, further comprising:

one or plural functional processors each capable of a functional processing different from ~~said same-functional processing~~processings of the other functional processors,

wherein when it has been judged by said function item judgment unit that plural types of functional ~~processing~~processings are necessary for said incoming packet, said forwarding information generator imparts, to said incoming packet, a plurality of forwarding information corresponding to a plurality of ports, to which plural types of functional processors corresponding to functional processing of said plural types are connected respectively.

14. (previously presented) The packet communication device according to Claim 13, wherein said function item judgment unit comprises:

a function search unit for searching, based on address information imparted to said incoming packet, types of functional processing required by said incoming packet and a port to which a line interface for transmitting said incoming packet after the processing to the outside is connected;

a function item search unit for searching function items of functional processors connected to said plural ports and a connection number for each function item; and

a port search unit for searching function items of functional processors to be connected correspondingly to each of said plural ports.

15. (previously presented) The packet communication device according to claim 3, wherein said functional judgment unit and said forwarding information generator are installed in at least one of said plurality of line interfaces.

16. (previously presented) The packet communication device according to claim 4, wherein said functional judgment unit and said forwarding information generator are installed in at least one of said plurality of line interfaces.

17. (previously presented) The packet communication device according to claim 5, wherein said functional judgment unit and said forwarding information generator are installed in at least one of said plurality of line interfaces.

18. (previously presented) The packet communication device according to claim 6, wherein said functional judgment unit and said forwarding information generator are installed in at least one of said plurality of line interfaces.

19. (previously presented) The packet communication device according to claim 3, wherein at least one said functional processor is further

provided with said functional judgment processor and said forwarding information generator.

20. (previously presented) The packet communication device according to claim 4, wherein at least one said functional processor is further provided with said functional judgment processor and said forwarding information generator.

21. (previously presented) The packet communication device according to claim 5, wherein at least one said functional processor is further provided with said functional judgment processor and said forwarding information generator.

22. (previously presented) The packet communication device according to claim 6, wherein at least one said functional processor is further provided with said functional judgment processor and said forwarding information generator.

23. (previously presented) The packet communication device according to claim 7, wherein at least one said functional processor is further provided with said functional judgment processor and said forwarding information generator.